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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,620	09/16/2003	Syamal K. Ghosh	86897RLO	3531

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Thomas H. Close
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER

WOLLSCHLAGER, JEFFREY MICHAEL

ART UNIT PAPER NUMBER

1732

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,620

Applicant(s)

GHOSH ET AL.

Examiner

Jeff Wollschlager

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1- 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (U.S. Patent Application Publication 2003/0008071; published January 9, 2003) in view of Okuyama et al. (U.S. Patent 6,835,681; issued December 28, 2004; filed December 19, 2001).

With regard to claim 1, Van Slyke et al. teach a method for forming a homogeneous mixture of powders of organic material including at least one dopant component and one host component to provide a homogeneous mixture for forming a pellet for thermal physical vapor deposition producing an organic layer on a substrate

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for use in an organic light-emitting device comprising a) combining organic materials, such materials including at least one dopant component and one host component (paragraph [0112-0113]). Van Slyke et al. additionally teach g) combining the homogeneous mixture of organic powder to form a pellet suitable for thermal physical vaporization to produce an organic layer on a substrate for use in an organic light-emitting device (claim 32). Van Slyke et al. teach a generic mixing method, but do not teach the mixing limitations set out in Claim 1 b) – f).

Okuyama et al. teach an analogous method of mixing powders by b) providing a liquid to emulsify the materials, c) mixing the emulsified materials (col. 4, lines 19-25 and 30-33), d) heating the materials in a container until the liquid is evaporated and a solidified homogeneous mixture of materials remains (col. 4 lines 35-39), e) removing the solidified homogeneous mixture of materials from the container and f) pulverizing the solidified mixture of materials into a homogeneous mixture of powder (col. 4 lines 44-45).

Therefore it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the claimed invention to modify the method of Van Slyke et al. of mixing a powder mixture of organic materials containing at least one host material and one dopant material prior to forming a pellet from the homogeneous mixture for thermal physical vapor deposition with the method of mixing powders taught by Okuyama et al. because Van Slyke et al. provide a generic teaching of mixing that would have motivated one of ordinary skill to find additional details on a method of mixing powders. Okuyama et al. teach a method of mixing powders in a relatively uncomplicated manner

(col. 4 lines 30-34). This uncomplicated manner of mixing taught by Okuyama et al. would have been an obvious choice to one of ordinary skill in the art. Thus, the claimed invention as a whole was *prima facie* obvious over the combined teachings of the prior art.

Claim 2 is directed toward the amount of dopant component in the mixture formed by the method of claim 1. The claimed range is 0.1 – 20% by weight. Van Slyke et al. teach that any range of dopant material may be selected (Claim 32, step b)). This is read to be from 0 – 100%. As such, the claimed range and the range of the prior art overlap. Additionally, as taught by Van Slyke et al. the amount of dopant added is dependent on various factors (paragraph [0112]) and would be subject to routine experimentation and readily optimized as a result effective variable.

Regarding claim 3, Van Slyke et al. teach forming a pellet by applying sufficient pressure to the mixture, but do not teach compacting the mixture in a range of pressures between 3,000 – 20,000 pounds per square inch. However, Van Slyke et al. do teach that powders have problems in their utilization in thermal physical vapor deposition due to having a relatively low density (paragraph [0011]) and the fact that the material is difficult to heat due to low particle-to particle contact area (paragraph [0012]) and that these facts may have a negative impact on the ability of outgassing the material due to an inability to uniformly heat the material (paragraphs [0012 – 0013]). These variables are a function of the pressure under which the powder is converted into a pellet. As such, pressure is a result effective control variable that would have been readily optimized as is routinely practiced in the art.

Regarding claims 4 and 5, Okuyama et al. further teach the use of a metal platinum container for high temperature use (col. 6, lines 2-9). One of ordinary skill in the art would have been motivated at the time of the claimed invention to employ the high temperature platinum metal taught by Okuyama because platinum is routinely used in the art due to it being a noble metal with a high melting point.

Regarding claim 6, Okuyama et al. teach mixing with a ball mill (col 4. lines 23-25).

Claims 1- 3, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (U.S. Patent Application Publication) in view of Jamil et al. (U.S. Patent 6,440,587; issued August 27, 2002).

Regarding claim 1, Van Slyke et al. teach a method for forming a homogeneous mixture of powders of organic material including at least one dopant component and one host component to provide a homogeneous mixture for forming a pellet for thermal physical vapor deposition producing an organic layer on a substrate for use in an organic light-emitting device comprising a) combining organic materials, such materials including at least one dopant component and one host component (paragraph [0112-0113]). Van Slyke et al. additionally teach g) combining the homogeneous mixture of organic powder to form a pellet suitable for thermal physical vaporization to produce an organic layer on a substrate for use in an organic light-emitting device (claim 32). Van Slyke et al. teach a generic mixing method, but do not teach the mixing limitations set out in Claim 1 b) – f).

However, Jamil et al. teach an analogous method for mixing phosphor powders for producing a high resolution phosphor screen on a substrate for use in a light emitting device comprising: b) providing a liquid to emulsify the powder (col. 11, lines 22-32, it is noted that Jamil employs the same preferred solvent, isopropyl alcohol, as applicant), c) mixing the emulsified material to form a homogeneous mixture of material (col. 11, lines 32-42), d) heating the material in a container until the liquid is evaporated and a solidified homogeneous mixture of material remains (col. 11, lines 62-67), e) implicitly removing the mixture from the container and f) pulverizing the mixture into a homogeneous mixture of powder (col. 11, lines 59-61; col. 12, lines 1-20).

Therefore it would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the method of Van Slyke et al. to mix a powder mixture of organic materials containing at least one host material and one dopant material prior to forming a pellet from the homogeneous mixture for thermal physical vapor deposition with the method of mixing powder taught by Jamil et al. because Van Slyke et al. disclose a generic method of mixing and one of ordinary skill would have been motivated to find details to fill in the gaps. The method taught by Jamil would have been an obvious choice because it employs powders in an analogous process to form a light-emitting device that mixes powders in a readily understandable process. Thus, the claimed invention as a whole was *prima facie* obvious over the combined teachings of the prior art.

Claim 2 is directed toward the amount of dopant component in the mixture formed by the method of claim 1. The claimed range is 0.1 – 20% by weight. Van

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Slyke et al. teach that any range of dopant material may be selected (Claim 32, step b)). This is read to be from 0 – 100%. As such, the claimed range and the range of the prior art overlap. Additionally, as taught by Van Slyke et al., the amount of dopant added is dependent on various factors (paragraph [0112]) and would be subject to routine experimentation and readily optimized as a result effective variable.

Regarding claim 3, Van Slyke et al. teach forming a pellet by applying sufficient pressure to the mixture, but do not teach compacting the mixture in a range of pressures between 3,000 – 20,000 pounds per square inch. However, Van Slyke et al. do teach that powders have problems in their utilization in thermal physical vapor deposition due to having a relatively low density (paragraph [0011]) and due to the fact that the material is difficult to heat due to low particle-to particle contact area (paragraph [0012]) and that these facts may have a negative impact on the ability of outgassing the material due to an inability to uniformly heat the material (paragraphs [0012 – 0013]). These variables are a function of the pressure under which the powder is converted into a pellet. As such, pressure is a result effective control variable that would be readily optimized as is routinely practiced in the art.

As to claim 6, Jamil et al. teach mixing the suspension with an ultrasonic probe/horn (col. 16, lines 35-37). One of ordinary skill would have been motivated to use the ultrasonic probe/horn as taught by Jamil et al. for the purpose of minimizing mechanical contact with the mixture in order to reduce contamination (col. 11, lines 35-38).

As to claim 7, Jamil et al. does not teach the frequency at which the ultrasonic probe/horn is to be operated. However, the degree of mixing is impacted by speed of the mixing device. If mixing were incomplete, the homogeneous mixture, as required by Van Slyke et al. would not be formed. As such, mixing speed is a result effective variable that would have been readily optimized as is routinely practiced in the art. Additionally, ultrasonic mixing probes/horns that operate in the claimed range are routinely used and readily available commercially.

Response to Arguments

Applicant's arguments filed April 6, 2006 have been fully considered but they are not fully persuasive.

Applicant's arguments with respect to Van Slyke et al. (U.S. Patent 6,797,314) have been fully considered and are persuasive. Van Slyke et al. (U.S. Patent 6,797,314) has been withdrawn and has been replaced with Van Slyke et al. (U.S. Patent Application Publication 2003/0008071; issued January 9, 2003).

In response to applicant's argument that Okuyama et al. is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir.

1992). In this case, the problem being solved is mixing powders. As such, when Van Slyke et al. teach a generic method of mixing organic powder one of ordinary skill would have been motivated to find a suitably detailed method of mixing. As taught by Okuyama et al. the method of Okuyama et al. is an uncomplicated method of mixing powders and as such would provide motivation to one of ordinary skill to adopt the method.

Applicant's arguments with respect to claims 6 and 7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

All claims are rejected.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U.S. Patent No. 6,649,436: Ghosh et al. teach using organic materials in making an organic light emitting device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Friday 7:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JW

Jeff Wollschlager
Examiner
Art Unit 1732

April 24, 2006


MICHAEL P. COLAIANNI
SUPERVISORY PATENT EXAMINER